IEI Technology Corp.

MODEL:

IDDV-6301100

100 W DC to DC
Smart Single 12 V Converter Module for Vehicle

User Manual

Rev. 1.00 July 2008

RoHS Lead Free

Revision

Date	Version	Changes
2008-07	v1.00	Initial Release

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Manual Conventions

WARNING!

Warnings appear where overlooked details may cause damage to the equipment or result in personal injury. Warnings should be taken seriously. Warnings are easy to recognize. The word “warning” is written as “**WARNING**,” both capitalized and bold and is followed by text. The text is the warning message. A warning message is shown below:

WARNING:

This is an example of a warning message. Failure to adhere to warning messages may result in permanent damage to the IDDV-6301100 or personal injury to the user. Please take warning messages seriously.

CAUTION!

Cautionary messages should also be heeded to help reduce the chance of losing data or damaging the IDDV-6301100. Cautions are easy to recognize. The word “caution” is written as “**CAUTION**,” both capitalized and bold and is followed. The italicized text is the cautionary message. A caution message is shown below:

CAUTION:

This is an example of a caution message. Failure to adhere to cautions messages may result in permanent damage to the IDDV-6301100. Please take caution messages seriously.

NOTE:

These messages inform the reader of essential but non-critical information. These messages should be read carefully as any directions or instructions contained therein can help avoid making mistakes. Notes are easy to recognize. The word “note” is written as “**NOTE**,” both capitalized and bold and is followed by text. The text is the cautionary message. A note message is shown below:

NOTE:

This is an example of a note message. Notes should always be read. Notes contain critical information about the IDDV-6301100. Please take note messages seriously.

Packing List

NOTE:

If any of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the IDDV-6301100 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The items listed below should all be included in the IDDV-6301100 package.

- 1 x IDDV-6301100 single 12 V converter module
- 1 x QIG (Quick Installation Guide)
- 1 x Wire cable for LED or amplifier

Images of the above items are shown in **Chapter 3**.

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Chapter

1

Introduction

1.1 IDDV-6301100 Overview

Figure 1-1: IDDV-6301100 DC-to-DC Converter Module

The highly efficient, high-performance 100-watt IDDV-6301100 DC-to-DC converter module provides a single 12 V output for car PC and battery-powered applications. The IDDV-6301100 receives a wide range of inputs between 6 V and 30 V DC. The IDDV-6301100 is built on an intelligent design and provides outstanding line and load regulations. The IDDV-6301100 is capable of sustaining 90% power efficiency.

With the IDDV-6301100 module, the motherboard power on/off is controlled by the vehicle ignition. The user can shutdown the motherboard remotely through the optional infrared interface. The IDDV-6301100 also supports the amplifier on delay function to prevent a loud pops when the PC starts.

The power module also has the ability to cut off the 12 V rail after an amount of time (defined by jumper settings) to prevent the battery from draining. If the 12 V rail is set to always active, the IDDV-6301100 monitors the battery voltage. When the battery voltage is below 10.7 V for more than thirty seconds, the IDDV-6301100 shuts down. The IDDV-6301100 reactivates again only when the input voltage is higher than 10.7 V.

1.2 IDDV-6301100 Power Module Features

- Highly compact design
- Smart system on/off control
- High efficiency up to 90%
- Load down protection
- Over voltage protection
- Over current protection
- Short circuit protection
- Battery voltage monitor
- Amplifier on-delay control
- RoHS compliant
- Power off remotely by infrared interface (optional)
- Electrical Specifications:
  - Total output capacity: 100 W
    - 12 V @ 8 A Max.
  - Input Voltage: 6 V DC to 30 V DC
    - Min. input operating voltage: 5.7 V
    - Max. input operating voltage: 30 V
  - Min. Power Up Voltage: 8 V
  - Deep discharged shut down voltage: 10.6 V
- Dimensions: 45 mm x 160 mm
- Environment:
  - Operating temperature: -20°C ~ +85°C
  - Storage temperature: -40°C ~ +125°C
- Weight: NW: 118 g

1.3 IDDV-6301100 Dimensions

Figure 1-2 shows the IDDV-6301100 dimensions. The dimensions are given in inches.

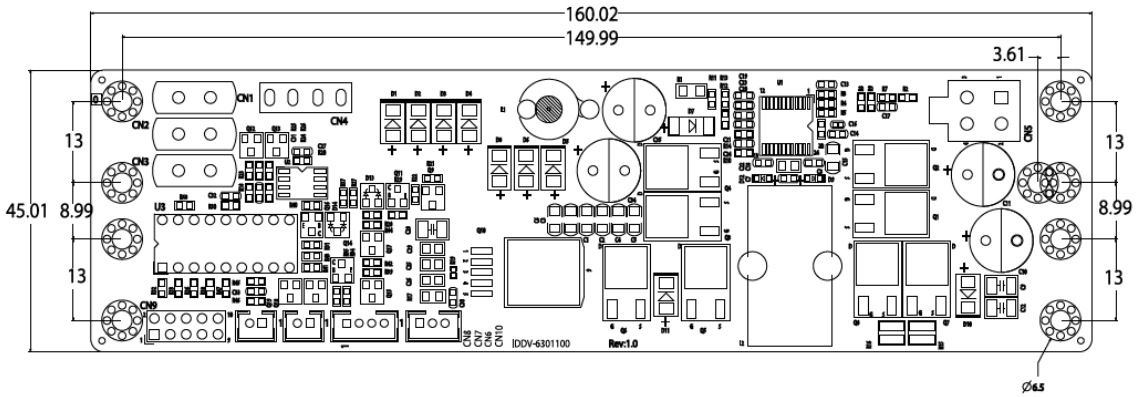

Figure 1-2: IDDV-6301100 Dimensions (mm)

Chapter

2

Detailed Specifications

2.1 IDDV-6301100 System Block Diagram

Figure 2-1 shows the system block diagram of the IDDV-6301100. The detailed descriptions of the system operation are described in the following sections.

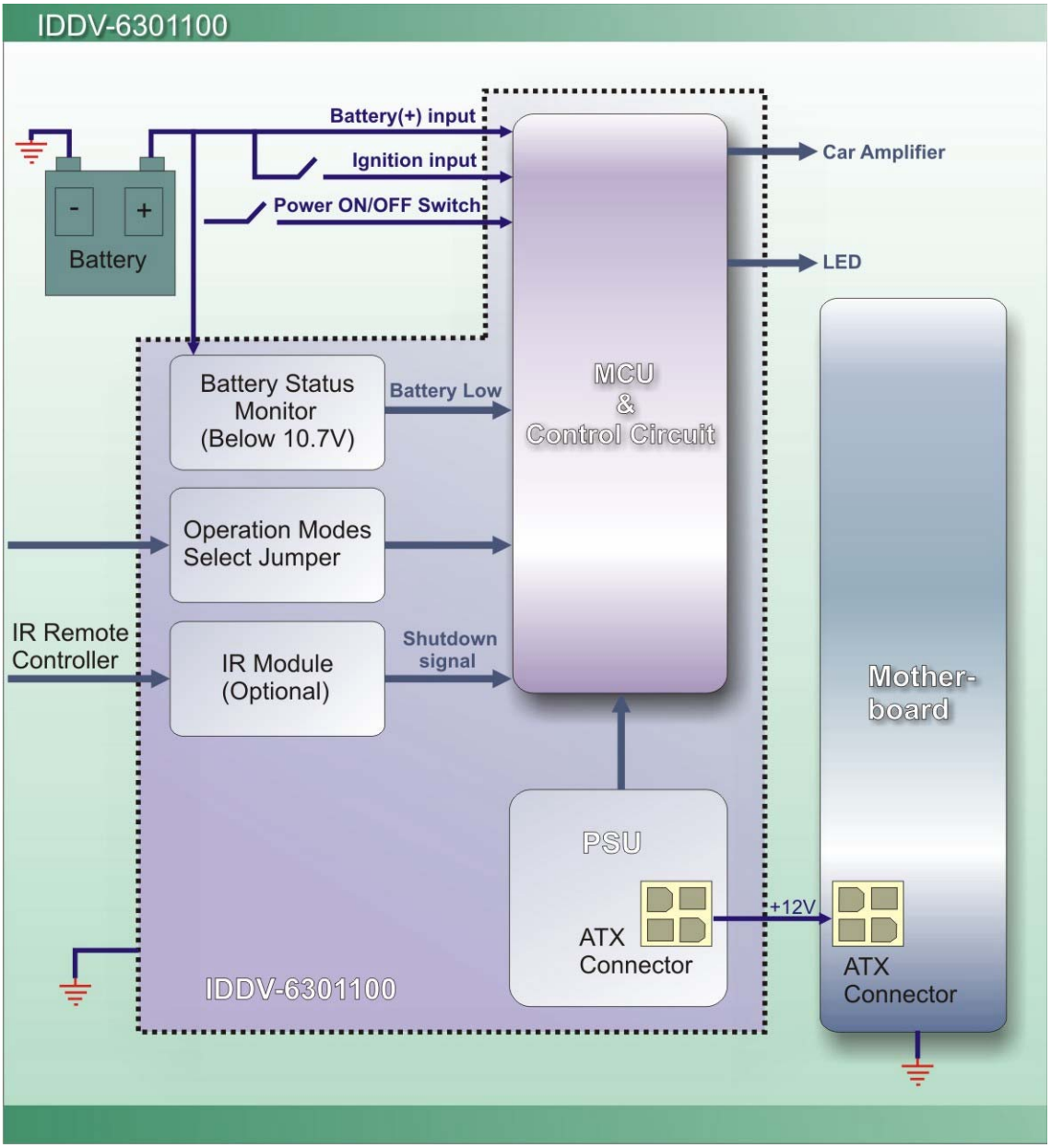

Figure 2-1: IDDV-6301100 System Block Diagram

2.1.1 Functionalities

The IDDV-6301100 has following functionalities:

- Provides power to PSU, MCU and other circuit
- Power on/off controlled by ignition
- Battery status monitor
- Six different operation modes to select hard off delay time
- Avoids the loud pop when engine starts
- Supports battery low LED
- Supports 4-pin power connector
- IR module supported (optional)

2.2 Battery and Ignition Input

The car battery connects to the IDDV-6301100 to provide power to PSU, MCU and other circuit board. The power on/off is controlled by the vehicle ignition. When the engine is started, the IDDV-6301100 is on automatically or can be turned on; when the engine is turned off, the device is off.

2.3 Battery Status Monitor

The IDDV-6301100 continues to monitor the battery voltage when 12 V rail is always active. When the battery voltage is below 10.7 V for more than 30 seconds, the IDDV-6301100 shuts down. The IDDV-6301100 reactivates again only when the input voltage is higher than 10.7 V.

2.4 Car Amplifier

There is a loud pops when the PC starts if the PC is connected to the car amplifier. The IDDV-6301100 can keep the amplifier off while the PC starts. To enable this feature, connect the amplifier on delay function connector to the car stereo amplifier (refer to **Section 4.2.3**).

2.5 Operation Modes

The user can use the jumper (CN9) to set the hard-off delay time of the IDDV-6301100 when the car is off. The following table lists the six conditions (depending on the jumper settings) when turning off the vehicle engine.

	Jumper	Hard Off Delay
Case 1		After **20 seconds**, cut off 12 V rail.
Case 2		After **40 seconds**, cut off 12 V rail.
Case 3		After **60 seconds**, cut off 12 V rail.
Case 4		After **80 seconds**, cut off 12 V rail.
Case 5		After **100 seconds**, cut off 12 V rail.
Case 6		After **120 seconds**, cut off 12 V rail.

Table 2-1: Operation Modes

NOTE:

If the motherboard fails to perform normal shutdown, IDDV-6301100 waits 1 more minute to turn off the motherboard by force.

2.6 IR Module (Optional)

The user can shut down the device by the IR remote controller.

Chapter

3

Unpacking

3.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the IDDV-6301100 may result in permanent damage to the IDDV-6301100 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IDDV-6301100. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IDDV-6301100, or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***: Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the IDDV-6301100, place it on an antic-static pad. This reduces the possibility of ESD damaging the IDDV-6301100.
- ***Only handle the edges of the PCB***: When handling the PCB, hold the PCB by the edges.

3.2 Unpacking

3.2.1 Unpacking Precautions

When the IDDV-6301100 is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 3.1**.
- Make sure the packing box is facing upwards so the IDDV-6301100 does not fall out of the box.

- Make sure all the components shown in **Section 3.3** are present.

3.3 Unpacking Checklist

NOTE:

If some of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the IDDV-6301100 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

3.3.1 Package Contents

The IDDV-6301100 is shipped with the following components:

Quantity	Item	Image
1	IDDV-6301100 DC-to-DC converter module	
1	Wire cable for LED/amplifier (**P/N**: 32100-153500-RS)	
1	QIG (Quick Installation Guide)	

Table 3-1: Package List Contents

Chapter

4

Connectors and Jumpers

4.1 Peripheral Interface Connectors

Section 4.1.2 shows peripheral interface connector locations. **Section 4.1.2** lists all the peripheral interface connectors seen in **Section 4.1.2**.

4.1.1 IDDV-6301100 Layout

Figure 4-1 shows the on-board peripheral connectors, rear panel peripheral connectors and on-board jumpers.

Figure 4-1: Connector and Jumper Locations

4.1.2 Peripheral Interface Connectors

Table 4-1 shows a list of the peripheral interface connectors on the IDDV-6301100. Detailed descriptions of these connectors can be found below.

Connector	Type	Label
Amplifier on delay function connector	4-pin wafer connector	CN6 (pin 3, pin 4)
Power output connector	4-pin connector	CN5
Battery low LED connector	4-pin wafer connector	CN6 (pin 1, pin 2)
Fuse connector	Mini blade fuses	CN4
Input power connector	Blade connector	CN1, CN2, CN3
IR connector	3-pin wafer connector	CN22

Power switch connector	2-pin wafer connector	CN8

Table 4-1: Peripheral Interface Connectors

4.1.3 Jumpers

Table 4-2 lists the jumper on the IDDV-6301100. Detailed descriptions of this jumper can be found in **Section 0**.

Connector	Type	Label
Operation mode select jumper	10-pin header	CN9

Table 4-2: Rear Panel Connectors

4.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the IDDV-6301100.

4.2.1 ATX Power Connector

CN Label: **CN5**

CN Type: 4-pin connector (2x2)

CN Location: See **Figure 4-2**

CN Pinouts: See **Table 4-3**

The 4-pin ATX power connector is connected to an ATX power connector on the motherboard to provide output power.

Figure 4-2: ATX Power Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	GND
3	+12V	4	+12V

Table 4-3: ATX Power Connector Pinouts

4.2.2 Battery Low LED Connector

CN Label: **CN6** (pin 1, pin 2)

CN Type: 4-pin wafer connector (1x4)

CN Location: See **Figure 4-3**

CN Pinouts: See **Table 4-4**

This connector is connected to a power LED indicator that blinks when the battery is low.

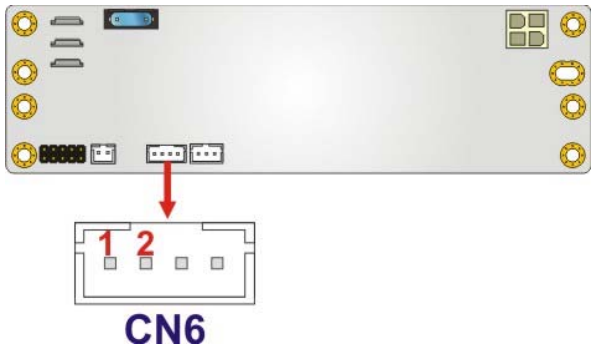

Figure 4-3: Battery Low LED Connector Location

PIN NO.	DESCRIPTION
1	LEDA
2	LEDB

Table 4-4: Battery Low LED Connector Pinouts (CN6)

4.2.3 Amplifier On Delay Function Connector

CN Label: **CN6** (pin 3, pin 4)

CN Type: 4-pin wafer connector (1x4)

CN Location: See **Figure 4-4**

CN Pinouts: See **Table 4-5**

This connector is connected to the car stereo amplifier to avoid the loud pop when the engine starts.

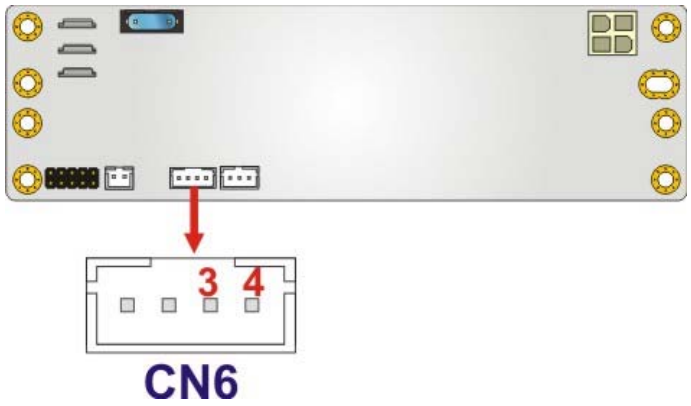

Figure 4-4: Amplifier On Delay Function Connector Location

PIN NO.	DESCRIPTION
3	AMP
4	GROUND

Table 4-5: Amplifier On Delay Function Connector Pinouts (CN6)

4.2.4 Input Power Connectors

CN Label: **CN1, CN2, CN3**

CN Type: Blade connector

CN Location: See **Figure 4-5**

CN Pinouts: See **Table 4-6**

The input power connectors are connected to the car battery and the car ignition switch.

Figure 4-5: Input Power Connector Locations

Connector	DESCRIPTION
CN1	Battery(+)
CN2	ACC On (signal) (Ignition)
CN3	Battery(-) (GND)

Table 4-6: Input Power Connector Pinouts

Use the following cable to connect CN1, CN2 and CN3 with car battery and car ignition switch:

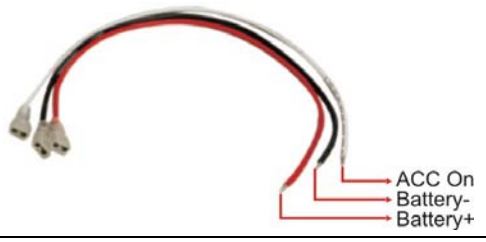	Wire to battery and ACC on (**P/N**: CB-BATACC-RS)

Figure 4-6: CN1, CN2, CN3 Connector Cables

4.2.5 Infrared Interface Connector (Optional)

CN Label: **CN10**

CN Type: 3-pin wafer connector (1x3)

CN Location: See **Figure 4-7**

CN Pinouts: See **Table 4-7**

The Infrared interface connector is connected to an IR module to enable IR remote control function.

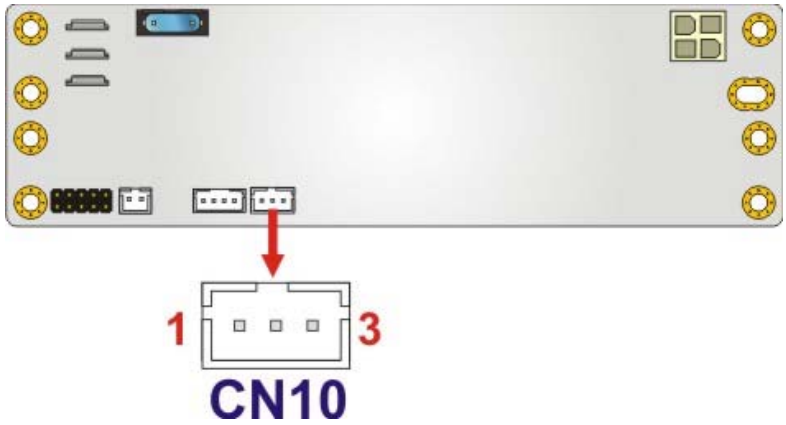

Figure 4-7: Infrared Interface Location

PIN NO.	DESCRIPTION
1	GROUND
2	Vcc (P5V)
3	IRRX

Table 4-7: Infrared Interface Connector Pinouts

4.2.6 Power Switch Connector

CN Label: **CN8**

CN Type: 2-pin wafer connector (1x2)

CN Location: See **Figure 4-8**

CN Pinouts: See **Table 4-8**

This connector is connected to a power on/off switch.

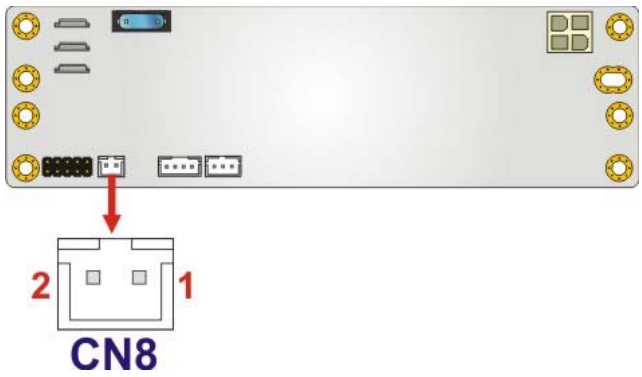

Figure 4-8: Power Switch (External) Connector Location

PIN NO.	DESCRIPTION
1	GND
2	5V

Table 4-8: Power Switch (External) Connector Pinouts

4.3 Jumper Settings

NOTE:

A jumper is a metal bridge used to close an electrical circuit. It consists of two or three metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.

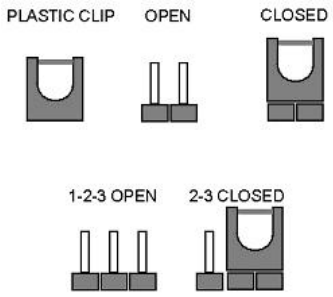

Figure 4-9: Jumper Locations

Before the IDDV-6301100 is installed in the system, the jumper must be set in accordance with the desired configuration. The jumper on the IDDV-6301100 is listed in **Table 4-9**.

Description	Label	Type
Operation mode select jumper	10-pin header	CN9

Table 4-9: Jumper

4.3.1 Operation Mode Select Jumper

CN Label: **CN9**

CN Type: 10-pin connector (2x5)

CN Location: See **Figure 4-10**

CN Pinouts: See **Table 4-10**

The operation mode select jumper allows the user to select the hard-off delay time (refer to **Section 2.5**) of the IDDV-6301100 when the car is off.

Figure 4-10: Operation Mode Select Jumper Location

FUNCTION	Pin 1-2	Pin 3-4	Pin 5-6	Pin 7-8	Pin 9-10
Case 1	short	open	open	open	open
Case 2	open	short	open	open	open
Case 3	short	short	open	open	open
Case 4	open	open	short	open	open
Case 5	short	open	short	open	open
Case 6	open	short	short	open	open

Table 4-10: Operation Mode Select Jumper Pinouts